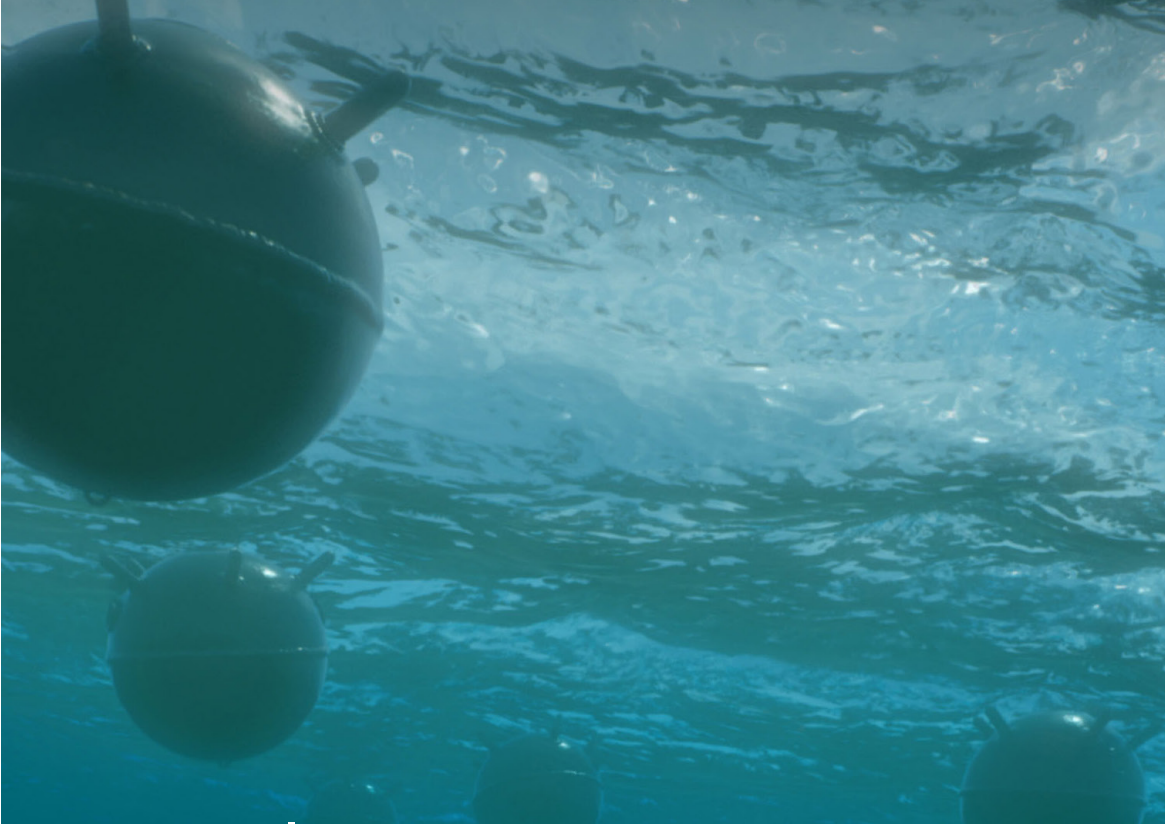


REMOVAL OF WRECKS AND MUNITIONS FROM EUROPEAN SEAS

Overview of Ongoing Projects

MMinE-SwEEPER

Funded by the European Union

MMinE-SwEEPER:

Marine Munition in Europe - Solutions with Economic and Ecological Profits for Efficient Remediation

Funding: Horizon Europe
Duration: 10/2024 - 03/2028

The MMinE-SwEEPER project aims to enhance Europe's capacity for non-military UXO clearance. It focuses on advancing technologies such as automated detection, environmental monitoring, burial and corrosion predictions, and secure data exchange. Additional efforts include compiling knowledge, addressing legal frameworks, developing training, and stakeholder outreach. Outcomes include AI-supported detection, identification, and Smart-AUV/USV integration, with technologies reaching a stage where they are tested in real-world conditions and ready for further development toward commercial use.

https://mminesweeper-munition.eu/

Project Coordinator:
Prof. Dr. Jens Greinert, GEOMAR Helmholtz Centre for Ocean Research Kiel

Partners:

- Aarhus University (DK)
- Baltic Marine Environment Protection Commission - Helsinki Commission (FI)
- Bundeswehr Technical Center for Ships and Naval Weapons, Maritime Technology and Research (DE)
- Cranfield University (UK)

- Explosive Ordnance Disposl Service Schleswig-Holstein (DE)
- Federal Police Germany (DE)
- Flanders Marine Institute (BE)
- Fraunhofer ICT (DE)
- Institute of Oceanology of the Polish Academy (PL)
- IQUA Robotics (ES)
- JPI Oceans (BE)
- National Research Council of Italy (IT)
- Naval Hydrographic and Oceanographic Service (FR)
- North.io (DE)
- Norwegian Defence Research Establishment (NO)
- Royal Military Academy Belgium (BE)
- SeaTerra (DE)
- The Border Guard Academy in Koszalin (PL)
- University of Tromso - The Arctic University (NO)

Contact: mmine-sweeper@geomar.eu

MUNI-RISK:

Mitigation of Risks due to submerged munitions
for a sustainable development of the Baltic Sea

Co-funded by
the European Union

Funding: EMFAF
Duration: 11/2024-10/2027

MUNI-RISK is an EU-funded project focused on tackling the risks from old munitions lying on the seabed in the Baltic Sea. These munitions, remnants of past conflicts such as the Second World War, pose environmental and safety risks that need to be carefully managed. MUNI-RISK brings together scientists and practitioners to find solutions that support safe maritime activities, such as fishing, and responsible marine resource development, including building offshore wind farms. By the end of the MUNI-RISK project, countries around the Baltic Sea will have practical tools and guidelines to safely manage munitions risks.

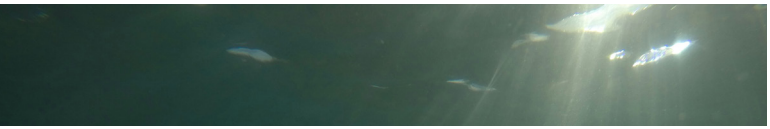
https://muni-risk.eu/

Project Coordinator:
Senior Scientist Hans Sanderson, Aarhus University

Partners:

- Council of the Baltic Sea States (SE)
- GEOMAR Helmholtz Centre of Ocean Research Kiel (DE)
- Institute of Oceanology Polish Academy of Sciences (PL)
- Baltic Marine Environment Protection Commission - Helsinki Commission (FI)
- Regional Municipality of Bornholm (DK)

Contact: hasa@envs.au.dk



CAMMera

Co-funded by the European Union

CAMMera:

Clearance Activities for Marine Munition through Efficient Remediation Approaches

Funding: Pilot Project and Preparatory Actions Fund
Duration: 7/2025-6/2028

CAMMera targets the final stage in the process of dealing with marine munitions: Based on previous research into detection and environmental monitoring, the project is developing industrial-scale solutions such as automated recovery of fragile objects, remote-controlled transport systems, automated disassemble technologies and security measures for the working area. It also addresses legal aspects and looks into a business model for European clearance activities, by ensuring knowledge and best practice are transferred to stakeholders covering all European seas, including the Black Sea.

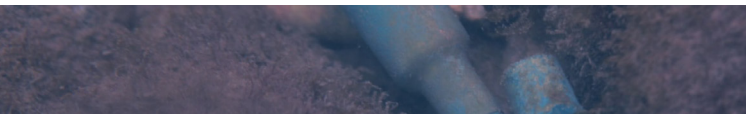
https://cammera-munition.eu/

Project Coordinator:
Prof. Dr. Jens Greinert, GEOMAR Helmholtz Centre for Ocean Research Kiel

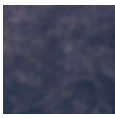
Partners:

- GEOMAR Helmholtz Centre for Ocean Research Kiel (DE)
- Altamira Softworks (SK)
- COALAS Systems (UA)
- Dynasafe Demil Systems (SE)
- Fugro (NL)
- JPI Oceans (BE)
- New Strategy Center (RO)
- SeaTerra (DE)
- GEKA (DE)

Contact: cammera@geomar.de



Interreg Baltic Sea Region
Co-funded by the European Union
SUSTAINABLE WATERS
MUNIMAP



MUNIMAP:

Baltic Sea Munitions Remediation Roadmap

Funding: Interreg Baltic Sea Region Programme 2021-2027
Duration: 3/2024-2/2027

MUNIMAP will accelerate and coordinate national munition management programmes by developing a modular roadmap for Baltic Sea munitions remediation. This includes policy recommendations, IT tools for site prioritisation, monitoring strategies, and innovative, cost-effective, eco-friendly remediation methods, all designed with user groups.

Pilot activities will cover key remediation stages: detection, risk assessment, prioritisation, remediation, monitoring, and result evaluation. The project supports national authorities and agencies facing legal, financial, and practical challenges in managing sea-dumped munitions while ensuring safety and environmental protection.

https://interreg-baltic.eu/project/munimap/

Project Coordinator:
Prof. Jacek Bełdowski, Institute of Oceanology Polish Academy of Sciences

Partners:

- Aarhus University (DK)
- Alfred Wegener Institute, Helmholfz Centre for Polar and Marine Research (DE)
- Baltic Marine Environment Protection Commission - Helsinki Commission (FI)
- Council of the Baltic Sea States (SE)
- German Environment Agency (DE)
- International Centre for Chemical Safety and Security (PL)
- K.U.M. Environmental- and Marine Technology (DE)
- Latvian Institute of Aquatic Ecology (LV)
- Lithuanian Environmental Protection Agency (LT)
- Maritime Office Gdynia (PL)
- Military University of Technology (PL)
- North.io (DE)
- Norwegian Defense Research Establishment (NO)
- Polish Naval Academy (PL)
- University of Helsinki - Finnish Institute for Verification of the Chemical Weapons Convention (FI)
- University of Tartu (FI)

Contact:

Jacek Bełdowski (Project Coordinator): hyron@iopan.pl
Katarzyna Fidler (Project Manager): kf@eu-projects.pl
Agnieszka Jędruch (Communication Officer): ajedruch@iopan.pl

Interreg North Sea
Co-funded by the European Union
REMARCO

REMARCO:

Remediation, Management, Monitoring and Cooperation addressing North Sea UXO

Funding: Interreg North Sea Region Programme 2021-2027
Duration: 07/2023 - 06/2027

After decades in seawater, the munitions from the world wars are in various stages of corrosion. Apart from the dangers of an uncontrolled explosion, water, sediment and samples of organisms were taken as part of the predecessor project North Sea Wrecks, which showed traces of toxic munitions compounds in the subsequent laboratory analyses. These are suspected of causing health problems in exposed mussels and fish and could also end up on people's plates via food. With REMARCO, we want to contribute to the reduction of pollution of marine ecosystems by World War II munitions by developing remediation concepts for munitions hotspots and testing internationally validated (partially) automated monitoring concepts. In addition, REMARCO provides software-based risk assessment systems for the responsible authorities in the NSR area to prioritize contaminated marine areas. Furthermore, REMARCO provides information and data relevant for regional organizations (e.g., OSPAR, UNESCO) to include the topic in international monitoring strategies and in the assessment of cultural assets (wrecks).

www.interregnorthsea.eu/remarco/about-us

Project Coordinator:
Dr. Matthias Brenner, Alfred Wegener Institute, Helmholfz Centre for Polar and Marine Research (DE)

Partners:

- Expload (NL)
- Flanders Marine Institute (BE)
- German Maritime Museum (DE)
- Royal Belgian Institute of Natural Sciences (BE)
- University Medical School Schleswig-Holstein, Institute of Toxicology and Pharmacology (DE)
- NHL Stenden University of Applied Sciences - Maritime Institute WIllem Barentsz (NL)
- North.io (DE)
- Periplus Consultancy (NL)
- SeaTerra (DE)

Contact:

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remarco@awi.de

BaltWreck:

Preventing massive marine waters chemical pollution from the teaking wrecks and munition/ weapon dumps in the south Baltic

Funding: Interreg South Baltic Programme 2021-2027
Duration: 7/2024 - 6/2027

The BaltWreck project aims to reduce pollution in the Baltic Sea caused by hazardous substances from military and civilian shipwrecks, such as fuels and munitions. The project focuses on developing diagnostic methods for wrecks, studying remediation technologies for hazardous fuels and munitions, assessing the toxicological risks to marine ecosystems, and creating risk management tools. It includes engaging local municipalities in decision-making through workshops and campaigns, providing recommendations for policy makers, and creating documentation for cultural heritage institutions and virtual wreck tours to enhance tourism.

https://www.imp.gda.pl/en/projects/interreg-programmes/baltwreck/

Project Coordinator: Prof. Adam Cenian, Institute of Fluid-Flow Machinery Polish Academy of Sciences

Partners:

- Association of Polish Communes Euroregion Baltic (PL)
- Chalmers University of Technology (SE)
- CLEANERGY (PL)
- Gdynia Maritime University (PL)
- GEOMAR Helmholtz Centre for Ocean Research Kiel (DE)
- German Environment Agency (DE)
- Jagiellonian University (PL)
- JT Ship Service Tomasz Jatkowski (PL)
- Klaipeda University (LT)
- Leibniz-Institute for Baltic Sea Research Warnemünde (DE)
- Nature Research Centre (LT)
- North.io (DE)
- University of Gdansk(PL)

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cenian@imp.gda.pl

Safe BS2BKS:

Safe Actions for Environment – Baltic Solutions to the Black Sea

Funding: CBSS Project Support Facility
Duration: 09/2025-02/2027

The SAFE BS2B project aims to transfer and apply the most effective and environmentally safe Baltic Sea techniques for managing underwater munitions to the Black Sea region. HELCOM will use its macro-regional network to organise stakeholder dialogues and workshops supporting HELCOM BSAP action S34, ensuring broad cross-sectoral and scientific outreach, especially to Ukraine. Activities will promote the use of proven Baltic methods for assessing and mitigating munitions risks and protecting marine ecosystems. A key outcome will be an Action Plan with recommendations for safe and sustainable munitions management in the Black Sea.

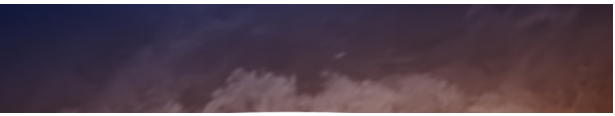
https://safe-bs2bks.vercel.app/

Project Coordinator:
Andriy Grafov, Baltic Marine Environment Protection Commission - Helsinki Commission (FI)

Partners:

- Aarhus University (DK)
- Latvian Institute of Aquatic Ecology (LV)
- Ukrainian Scientific Centre of Ecology of the Sea (UA)
- Institute of Marine Biology of the National Academy of Sciences (UA)
- Institute of Climate-Smart Agriculture of the National Academy of Agrarian Sciences (UA)

Contact:
andriy.grafov@helcom.fi



CONMAR II:

Concept for conventional Marine munition Remediation
in the German North and Baltic Sea

Funding: sustainMare "Protection and sustainable use of marine areas" by the Federal Ministry of Research, Technology and Space, Germany
Duration: 12/2024-11/2027

CONMAR, funded by the German Ministry of Education and Research, aims to study the impact of marine munitions in the North and Baltic Seas. It integrates data from various sources to assess distribution, ecological impact, and potential remediation strategies. Through collaboration with stakeholders, CONMAR seeks to inform policy and advance the understanding of this environmental issue.

https://conmar-munition.eu/

Project Coordinator:
Prof. Dr. Jens Greinert, GEOMAR Helmholtz Centre for Ocean Research Kiel

Partners:

- Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (DE)
- German Environment Agency (DE)
- Global Climate Forum (DE)
- Leibniz-Institute for Baltic Sea Research Warnemünde (DE)
- Senckenberg am Meer (DE)
- Thünen Institute (DE)
- University Medical School Schleswig-Holstein, Institute of Toxicology and Pharmacology for Natural Scientists (DE)
- University of Rostock (DE)

Contact: conmar@geomar.de

BorDEx:

Development and construction of a mobile demonstrator
for the thermal disposal of explosives from coastal dumped munitions

Funding:
Federal Ministry for Economic Affairs and Energy, Germany
Duration: 07/2024 - 06/2027

The BorDEx project (development and construction of a mobile demonstrator for the thermal disposal of explosives from coastal munitions waste) creates a basis for the disposal of critical munitions waste in coastal areas that has not yet been technically feasible. By building a mobile demonstrator, the disposal of conventional, large-caliber, difficult-to-transport munitions from maritime areas is to be taken one step closer to a standard procedure with different locations.

https://bordex.de/

Project Coordinator:
Dr. Bastian Niemeyer, GEKA

Partners:

- Dussmann Industrial Automation (DE)
- Dynasafe Environmental Systems (DE)
- Fraunhofer ICT (DE)
- GEOMAR Helmholtz Centre of Ocean Research Kiel (DE)

Contact:

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andreas.krueger@geka-munster.de

Federal Ministry
for Economic Affairs
and Energy

IRAV2:

Industrial Clearance of Contaminated Sites in Dumping Areas 2

Funding:
Federal Ministry for Economic Affairs and Energy, Germany
Duration: 03/2026 - 02/2029

The IRAV2 project develops innovative technologies to enable more efficient and safer clearance of legacy munitions in the North Sea and Baltic Sea. Its goal is to create a comprehensive system that significantly improves the detection and classification of submerged ordnance, both on the seabed and buried within sediments. By combining advanced sensor technologies (such as high-resolution sonar and seismic methods) with artificial intelligence, the project aims to establish automated analysis processes that complement human expertise and accelerate the evaluation of large data sets. This allows for more precise identification of hazardous remnants and reduces the risk of false alarms. The results of IRAV2 contribute to enhancing the safety of maritime infrastructure (e.g., pipelines and offshore wind farms), protecting the environment, and ensuring the sustainable use of marine resources.

Project Coordinator:
Franziska Auer, TKMS ATLAS ELEKTRONIK GmbH

Partners:

- Fraunhofer IWES (DE)
- Hochschule Bremen - City University of Applied Sciences (DE)

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WATERSIDE:

Removing ammunition remnants from the sea

Funding: German Aerospace Center e.V. (self-funded)
Duration: 01/2025 - 12/2027

The Waterside project uniquely integrates technologies from transport, space, security, and aviation to detect, identify, and remove explosive ordnance in marine environments, with a focus on the North and Baltic Seas. Developed in close cooperation with industry partners, it combines advanced underwater and long-range sensor technologies to generate comprehensive above- and below-water situation awareness. Passive, innovative sensors support munition identification, while teleoperated systems enable safe recovery and handling. Contaminated sites are systematically mapped and documented, supported by a secure service platform for standardized, cryptographically protected information exchange within an integrated system of systems.

www.dlr.de/en/ki/research-transfer/projects/waterside

Project Coordinator:
Dennis Höhn & Prof. Dr. Axel Hahn, German Aerospace Center e.V.

Partners:

German Aerospace Center e.V.

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‘Munitions in the Sea’ Knowledge Portal:

Our community page on LinkedIn: